

AMENDMENTS TO THE SPECIFICATION

At page 1, immediately after the title, please delete the centered heading as follows:

Description

At page 1, immediately before paragraph 0001, please insert the following heading at the left-hand margin:

Field of the Disclosure

At page 1, please amend paragraph 0001 as follows:

The present disclosure invention relates to systems, in which at least one machine is controlled, and, in particular, to a method, device and a system for displaying data of such a machine control system.

At page 1, immediately before paragraph 0002, please insert the following heading at the left-hand margin:

Background of the Disclosure

At page 1, please delete paragraphs 0003 and 0004 as follows:

~~Figure 1 shows a service terminal 2, which assists a user in the error search, maintenance, startup operations, etc., in the machine control system 1. The service terminal 2 comprises a monitor 18 as well as a keyboard 19. Furthermore, it is connected by wireless connection to the machine control system 1 or by a cable through the machine's access point 16.~~

~~In the machine control system 1, various machines 11-13 are interconnected by a bus 17, where each machine can comprise its own control unit. A data server 15 makes available all the data present in the system, for example, for representation on a stationary operator terminal 14 or on the mobile service terminal 2. For the normal control operation, the state of the system 1 or the state of one of the machines 11-13 (components) is represented on the operator terminal 14 in such a manner that the system 1 can be monitored and/or controlled at the operator terminal 14.~~

At page 2, immediately before paragraph 0007 please insert the following heading at the left-hand margin:

Summary of the Disclosure

At page 2, please delete paragraphs 0005 and 0006 as follows:

~~The terminal 2 usually uses a window-based operating system, software to control the system 1, and software for the representation of image data. The operator of the terminal 2 receives, from the control software, the status of components of the system in a first window. For this purpose, data are used, which are obtained from the data server 15. In an additional window, the operator can request at least portions of a circuit diagram of the system. The circuit diagram is here stored as an image file, showing, for example, an E-CAD drawing.~~

~~On the basis of the circuit diagram, the operator verifies how the individual electronic elements of the system 1 are connected to each other. In the second window, the operator determines for which element he/she should verify next the status in the first window, for example, to localize an error in a stepwise procedure. For the analysis of an erroneous state in the system 1, the operator of the terminal 2 therefore must continuously switch back and forth in an iterative process between the representation of the status data and the representation of the circuit diagram.~~

At page 2, please amend paragraph 0007 as follows:

Therefore, the problem of the present disclosure invention is to provide a method, a device and a system for displaying data of such a machine control system, which is easier to handle for the operator.

At page 2, please delete paragraph 0008 as follows:

~~This problem is solved by a method, a device and a system according to the independent claims. The dependent claims describe preferred embodiments of the invention.~~

At page 2, please amend paragraph 0009 as follows:

To display data of a machine control system, status data for at least one element of the system are received, according to the invention disclosure, which

data represent at least one physical state variable. The status data which are received for the element, are displayed to the operator in a circuit diagram, which shows, at least for the element, the electrical connection of the element in the system. The operator, thus, does not have to switch back and forth between the different windows. The start-up procedure, maintenance, error search, etc., of the machine control system become substantially more efficient, because the operator gains a better overview of the system status more quickly.

At page 3, please amend paragraph 0013 as follows:

According to additional embodiments of the method according to the invention disclosure, corresponding target values or limit values are displayed together with the status data for the element. In this manner, it is easier for the operator to control whether a value which is displayed for a state represents an error.

At page 3, please amend paragraph 0014 as follows:

In an additional embodiment of the invention disclosure, previous status data, which indicate at least one previous value for the state variable, are represented for the element. Thus, the operator can receive, even at a later time, a representation of the temporal variations of certain status data, for example, in a time window in front of a subdivided field.

At page 4, please amend paragraph 0015 as follows:

A device according to the invention disclosure is adapted for carrying out one of the above methods. Thus, a system according to the invention disclosure is formed from such a device and the machine control system.

At page 4, immediately before paragraph 0016 please insert the following heading at the left-hand margin:

Brief Description of the Drawings

At page 4, please amend paragraph 0016 as follows:

[0001] The invention disclosure is explained in greater detail with reference to the figures, which is shown individually:

Figure 1 - a machine control system with a maintenance terminal;

Figure 2 - a schematic representation of the units of a device according to the invention disclosure;

Figure 3 - a simplified representation in table form of connection data for a circuit diagram;

Figure 4 - a simplified representation in table form of status data of an element;

Figure 5 - a process diagram for a method according to the invention disclosure;

Figure 6 - a view of a window displayed on a monitor, in which status data of bus participants are represented according to the invention disclosure;

Figure 7 - a view of a window which is represented on a monitor, in which the status data for a component overview for units with several elements according to the invention disclosure are represented; and

Figure 8 - a view of a window which is represented on a monitor, in which the status data for individual elements in a current wiring diagram according to the invention disclosure are represented.

At page 4, immediately before paragraph 0017, please insert the following heading at the left-hand margin:

Detailed Description of the Disclosure

At page 4, please amend paragraph 0017 as follows:

The invention disclosure can be applied, for example, to the machine control system 1 which is shown in Figure 1 and has already been described. A machine control system denotes any system by means of which at least one machine is controlled. In a concrete embodiment, the machine control system is first limited only in that status data for the components of the system or their elements must be made available or accessible. These status data represent a physical state variable of the element, in particular during the control operation in the machine control system.

Beginning at page 4, and continuing at page 5, please delete paragraph 0018 as follows:

~~A machine control system denotes any system by means of which at least one machine is controlled. In a concrete embodiment, the machine control system is first limited only in that status data for the components of the system or their elements must be made available or accessible. These status data represent a physical state variable of the element, in particular during the control operation in the machine control system.~~

At page 5, immediately before paragraph 0019, please add the following paragraphs:

Figure 1 shows a service terminal 2, which assists a user in the error search, maintenance, startup operations, etc., in the machine control system 1. The service terminal 2 comprises a monitor 18 as well as a keyboard 19. Furthermore, it is connected by wireless connection to the machine control system 1 or by a cable through the machine's access point 16.

In the machine control system 1, various machines 11-13 are interconnected by a bus 17, where each machine can comprise its own control unit. A data server 15 makes available all the data present in the system, for example, for representation on a stationary operator terminal 14 or on the mobile service terminal 2. For the normal control operation, the state of the system 1 or the state of one of the machines 11-13 (components) is represented on the operator terminal 14 in such a manner that the system 1 can be monitored and/or controlled at the operator terminal 14.

The terminal 2 usually uses a window-based operating system, software to control the system 1, and software for the representation of image data. The operator of the terminal 2 receives, from the control software, the status of components of the system in a first window. For this purpose, data are used, which are obtained from the data server 15. In an additional window, the operator can request at least portions of a circuit diagram of the system. The circuit diagram is here stored as an image file, showing, for example, an E-CAD drawing.

On the basis of the circuit diagram, the operator verifies how the individual electronic elements of the system 1 are connected to each other. In the second window, the operator determines for which element he/she should verify next the status in the first window, for example, to localize an error in a stepwise procedure.
Previously, for the analysis of an erroneous state in the system 1, the operator of the terminal 2 had to continuously switch back and forth in an iterative process between the representation of the status data and the representation of the circuit diagram.

At page 5, please amend paragraph 0019 as follows:

However, Figure 2 shows functional units of a device according to the invention disclosure, where the device is also referred to as the end device below. Such an end device can be, for example, a mobile service or maintenance terminal. The system according to the invention disclosure is formed by the end device and machine control system.

At page 9, please amend paragraph 0043 as follows:

Figures 6-8 show three different views that are displayed for the operator on the monitor of an end device according to the invention disclosure. In each case, status data are represented on or at the represented elements.

At page 10, please amend paragraph 0051 as follows:

Individual advantages and characteristics of the invention disclosure are described in each instance with reference to only one figure. However, it is obvious that the advantages and characteristics can be combined with each other without any problem.

At page 11, please amend paragraph 0052 as follows:

The expression "circuit diagram," according to the invention disclosure, denotes wiring diagrams, construction diagrams, bus diagrams, apparatus part lists, clamp diagrams, cable diagrams, etc and similar representations.